| WRF-Hydro V5.1.1 Output Variable Matrix | OutputFile | Variable Name | Long Name | Description | IO_ConfigOutputs_0 | IO_Config Outputs_1 | IO_Config Outputs_2 | IO_ConfigOutputs_3 | IO_Config Outputs_4 | IO_ConfigOutputs_5 | IO_Config Outputs_6 | Min | Max | Scale | Offset | Fill | Special Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Streamflow output at all channel reaches/cells** | **CHRTOUT_DOMAIN** | time | valid output time | Valid output time | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | |
| | **CHRTOUT_DOMAIN** | reference_time | model initialization time | Model initialization time | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | |
| | **CHRTOUT_DOMAIN** | crs | CRS definition | Coordinate reference system | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | |
| | **CHRTOUT_DOMAIN** | feature_id | Reach ID | ID | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | |
| | **CHRTOUT_DOMAIN** | latitude | Feature latitude | Station latitude | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | |
| | **CHRTOUT_DOMAIN** | longitude | Feature Longitude | Station longitude | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | |
| | **CHRTOUT_DOMAIN** | order | Streamflow order | Strahler stream order for output reach or cell | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | |
| | **CHRTOUT_DOMAIN** | elevation | Feature Elevation | Elevation for output reach or cell | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | |
| | **CHRTOUT_DOMAIN** | streamflow | River Flow | Streamflow | Yes | Yes | Yes | Yes | Yes | Yes | Yes | 0 | 500000 | 0.01 | 0 | -9999 | |
| | **CHRTOUT_DOMAIN** | nudge | Amount of stream flow alteration | Streamflow nudge value (only if nudging DA is active) | Sometimes | Sometimes | Sometimes | Sometimes | Sometimes | Sometimes | Sometimes | -500000 | 500000 | 0.01 | 0 | -9999 | Values only when nudging DA is active |
| | **CHRTOUT_DOMAIN** | q_lateral | Runoff into channel reach | Lateral flow into channel reach or cell (q_lateral = qSfcLatRunoff + qBucket) | Yes | No | No | No | No | Yes | Yes | 0 | 500000 | 0.1 | 0 | -9999 | |
| | **CHRTOUT_DOMAIN** | velocity | River Velocity | Channel velocity | Yes | Yes | Yes | Yes | Yes | Yes | Yes | 0 | 500000 | 0.01 | 0 | -9999 | |
| | **CHRTOUT_DOMAIN** | Head | River Stage | River stage (gridded channel only) | Yes | No | No | No | No | No | No | 0 | 500000 | 0.01 | 0 | -9999 | |
| | **CHRTOUT_DOMAIN** | qSfcLatRunoff | Runoff from terrain routing | Flux from terrain routing | Sometimes | No | No | No | No | No | No | 0 | 500000 | 0.001 | 0 | -9999 | Only available for UDMP_OPT=1 and output_channelBucket_influx=1 or 2 |
| | **CHRTOUT_DOMAIN** | qBucket | Flux from gw bucket | Flux from groundwater buckets | Sometimes | No | No | No | No | No | No | 0 | 500000 | 0.001 | 0 | -9999 | Only available for UDMP_OPT=1 and output_channelBucket_influx=1 or 2 |
| | **CHRTOUT_DOMAIN** | qBtmVertRunoff | Runoff from bottom of soil to bucket | Flux from bottom of soil column into groundwater buckets | Sometimes | No | No | No | No | No | No | 0 | 500000 | 0.001 | 0 | -9999 | Only available for UDMP_OPT=1 and output_channelBucket_influx=2 |
| | **CHRTOUT_DOMAIN** | AccSfcLatRunoff | Accumulated runoff from terrain routing | Accumulated flux from terrain routing | Sometimes | No | No | No | No | No | No | 0 | 500000 | 0.01 | 0 | -9999 | Only available for UDMP_OPT=1 and output_channelBucket_influx=3 |
| | **CHRTOUT_DOMAIN** | accBucket | Accumulated runoff from gw bucket | Accumulated flux from groundwater buckets | Sometimes | No | No | No | No | No | No | 0 | 500000 | 0.01 | 0 | -9999 | Only available for UDMP_OPT=1 and output_channelBucket_influx=3 |
| **Streamflow on the 2D high resolution routing grid (gridded channel routing only)** | **CHRTOUT_GRID** | time | valid output time | Valid output time | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | Only active with gridded channel routing |
| | **CHRTOUT_GRID** | reference_time | model initialization time | Model initialization time | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | Only active with gridded channel routing |
| | **CHRTOUT_GRID** | x | x coordinate of projection | x coordinate (in native projection) | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | Only active with gridded channel routing |
| | **CHRTOUT_GRID** | y | y coordinate of projection | y coordinate (in native projection) | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | Only active with gridded channel routing |
| | **CHRTOUT_GRID** | crs | CRS definition | Coordinate reference system | Yes | Yes | Yes | Yes | Yes | Yes | Yes | | | | | | Only active with gridded channel routing |
| | **CHRTOUT_GRID** | Index | Stream cell index value | Stream cell index value | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | Only active with gridded channel routing |
| | **CHRTOUT_GRID** | streamflow | River Flow | Streamflow | Yes | Yes | Yes | Yes | Yes | Yes | Yes | 0 | 500000 | 0.1 | 0 | -9999 | Only active with gridded channel routing |
| **Streamflow output at forecast points or gage reaches/cells** | **CHANOBS_DOMAIN** | time | valid output time | Valid output time | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | |
| | **CHANOBS_DOMAIN** | reference_time | model initialization time | Model initialization time | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | |
| | **CHANOBS_DOMAIN** | crs | CRS definition | Coordinate reference system | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | |
| | **CHANOBS_DOMAIN** | feature_id | Reach ID | ID | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | |
| | **CHANOBS_DOMAIN** | latitude | Feature latitude | Station latitude | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | |
| | **CHANOBS_DOMAIN** | longitude | Feature longitude | Station longitude | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | |
| | **CHANOBS_DOMAIN** | order | Streamflow Order | output reach or cell | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | |
| | **CHANOBS_DOMAIN** | elevation | Feature Elevation | cell | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | |
| | **CHANOBS_DOMAIN** | streamflow | River Flow | Streamflow | Yes | Yes | Yes | Yes | Yes | Yes | Yes | 0 | 500000 | 0.01 | 0 | -9999 | |
| **Terrain routing variables on the 2D high resolution routing grid** | **RTOUT_DOMAIN** | time | valid output time | Valid output time | Yes | Yes | Yes | Yes | No | Yes | Yes | N/A | N/A | N/A | N/A | N/A | This file will not be output when io_config_outputs=4 |
| | **RTOUT_DOMAIN** | reference_time | model initialization time | Model initialization time | Yes | Yes | Yes | Yes | No | Yes | Yes | N/A | N/A | N/A | N/A | N/A | io_config_outputs=4 |
| | **RTOUT_DOMAIN** | x | x coordinate of projection | x coordinate (in native projection) | Yes | Yes | Yes | Yes | No | Yes | Yes | N/A | N/A | N/A | N/A | N/A | This file will not be output when io_config_outputs=4 |
| | **RTOUT_DOMAIN** | y | y coordinate of projection | x coordinate (in native projection) | Yes | Yes | Yes | Yes | No | Yes | Yes | N/A | N/A | N/A | N/A | N/A | This file will not be output when io_config_outputs=4 |
| | **RTOUT_DOMAIN** | crs | CRS definition | Coordinate reference system | Yes | Yes | Yes | Yes | No | Yes | Yes | N/A | N/A | N/A | N/A | N/A | This file will not be output when io_config_outputs=4 |
| | **RTOUT_DOMAIN** | SOIL_M | volumetric soil moisture | Volumetric soil moisture | Yes | No | No | No | No | No | No | 0 | 1 | 0.01 | 0 | -9999 | This file will not be output when io_config_outputs=4 |
| | **RTOUT_DOMAIN** | zwattablrt | water table depth | Depth to saturated layers (=2m when no saturation; =0 when fully saturated) | Yes | Yes | Yes | Yes | No | Yes | Yes | 0 | 10 | 0.1 | 0 | -9999 | This file will not be output when io_config_outputs=4 |
| | **RTOUT_DOMAIN** | sfcheadsubrt | surface head | Instantaneous value of depth of ponded water on surface | Yes | Yes | Yes | Yes | No | Yes | Yes | 0 | 1000000 | 1 | 0 | -9999 | This file will not be output when io_config_outputs=4 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **RTOUT_DOMAIN** | QSTRMVOLRT | channel inflow | channel inflow | Yes | No | No | No | No | No | No | 0 | 1000 | 1 | 0 | -9999 | io_config_outputs=4 |
| | **RTOUT_DOMAIN** | QBDRYRT | accumulated value of the boundary flux | Accumulated flow volume routed outside of the domain from the boundary cells | Yes | No | No | No | No | No | No | 0 | 1000 | 1 | 0 | -9999 | This file will not be output when io_config_outputs=4 |
| **Lake output variables** | **LAKEOUT_DOMAIN** | time | valid output time | Valid output time | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | |
| | **LAKEOUT_DOMAIN** | reference_time | model initialization time | Model initialization time | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | |
| | **LAKEOUT_DOMAIN** | crs | CRS definition | Coordinate reference system | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | |
| | **LAKEOUT_DOMAIN** | feature_id | Lake COMMON ID | Unique lake ID | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | |
| | **LAKEOUT_DOMAIN** | latitude | Lake latitude | Lake latitude | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | |
| | **LAKEOUT_DOMAIN** | longitude | Lake longitude | Lake longitude | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | |
| | **LAKEOUT_DOMAIN** | water_sfc_elev | Water Surface Elevation | sea level | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | |
| | **LAKEOUT_DOMAIN** | inflow | Lake Inflow | Total inflow into waterbody | Yes | Yes | Yes | Yes | Yes | Yes | Yes | -10000 | 10000 | 0.01 | 0 | -9999 | |
| | **LAKEOUT_DOMAIN** | outflow | Lake Outflow | Outflow from waterbody outlet | Yes | Yes | Yes | Yes | Yes | Yes | Yes | -10000 | 10000 | 0.01 | 0 | -9999 | |
| | **LAKEOUT_DOMAIN** | reservoir_type | reservoir_type | Reservoir type: 1=Level_pool, 2=USGS-persistence, 3=USACE-persistence, 4=RFC-forecasts | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | |
| | **LAKEOUT_DOMAIN** | reservoir_assimilated_value | reservoir_assimilated_value | Assimilated value in m3/s | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | |
| **Ground water output variables** | **GWOUT_DOMAIN** | time | valid output time | Valid output time | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | |
| | **GWOUT_DOMAIN** | reference_time | model initialization time | Model initialization time | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | |
| | **GWOUT_DOMAIN** | feature_id | Groundwater Bucket ID | Unique groundwater bucket ID | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | |
| | **GWOUT_DOMAIN** | inflow | Bucket Inflow | Total groundwater bucket inflow | Yes | Yes | Yes | Yes | Yes | Yes | Yes | -10000 | 10000 | 0.01 | 0 | -9999 | |
| | **GWOUT_DOMAIN** | outflow | Bucket Outflow | Total groundwater bucket outflow | Yes | Yes | Yes | Yes | Yes | Yes | Yes | -10000 | 10000 | 0.01 | 0 | -9999 | |
| | **GWOUT_DOMAIN** | depth | Bucket Depth | Groundwater bucket water level | Yes | Yes | Yes | Yes | Yes | Yes | Yes | -10000 | 10000 | 0.1 | 0 | -9999 | |
| **Land surface model output** | **LDASOUT_DOMAIN** | time | valid output time | Valid output time | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | |
| | **LDASOUT_DOMAIN** | reference_time | model initialization time | Model initialization time | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | |
| | **LDASOUT_DOMAIN** | x | x coordinate of projection | projection) | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | |
| | **LDASOUT_DOMAIN** | y | y coordinate of projection | projection) | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | |
| | **LDASOUT_DOMAIN** | crs | CRS definition | Coordinate reference system | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | |
| | **LDASOUT_DOMAIN** | IVGTYP | Dominant vegetation category | Dominant vegetation category | Yes | No | No | No | No | No | No | 0 | 100 | 1 | 0 | -9999 | |
| | **LDASOUT_DOMAIN** | ISLTYP | Dominant soil category | Dominant soil category | Yes | No | No | No | No | No | No | 0 | 100 | 1 | 0 | -9999 | |
| | **LDASOUT_DOMAIN** | FVEG | Green Vegetation Fraction | vegetation | Yes | No | No | No | No | No | No | 0 | 1 | 0.01 | 0 | -9999 | |
| | **LDASOUT_DOMAIN** | LAI | Leaf area index | Leaf area index | Yes | No | No | No | No | No | No | 0 | 20 | 0.1 | 0 | -9999 | |
| | **LDASOUT_DOMAIN** | SAI | Stem area index | Stem area index | Yes | No | No | No | No | No | No | 0 | 20 | 0.1 | 0 | -9999 | |
| | **LDASOUT_DOMAIN** | SWFORC | Shortwave forcing | Shortwave radiation forcing | Yes | No | No | No | No | No | No | -1000 | 3000 | 0.1 | 0 | -9999 | |
| | **LDASOUT_DOMAIN** | COSZ | Cosine of zenith angle | Cosine of zenith angle | Yes | No | No | No | No | Yes | No | -1 | 1 | 0.01 | 0 | -9999 | |
| | **LDASOUT_DOMAIN** | LWFORC | Longwave forcing | Longwave radiation forcing | Yes | No | No | No | No | No | No | -1500 | 1500 | 0.1 | 0 | -9999 | |
| | **LDASOUT_DOMAIN** | RAINRATE | Precipitation rate | Precipitation in model timestep | Yes | No | No | No | No | No | No | 0 | 100 | 0.00001 | 0 | -9999 | |
| | **LDASOUT_DOMAIN** | EMISS | Grid emissivity | Emissivity: grid-average | Yes | No | No | No | No | No | No | 0 | 1 | 0.01 | 0 | -9999 | |
| | **LDASOUT_DOMAIN** | FSA | Total absorbed SW radiation | Total absorbed SW radiation | Yes | No | No | Yes | No | Yes | Yes | -1500 | 1500 | 0.1 | 0 | -9999 | |
| | **LDASOUT_DOMAIN** | FIRA | Total net LW radiation to atmosphere | atmosphere) | Yes | No | No | Yes | No | Yes | Yes | -1500 | 1500 | 0.1 | 0 | -9999 | |
| | **LDASOUT_DOMAIN** | GRDFLX | Heat flux into the soil | (+ to soil) | Yes | No | No | Yes | No | No | Yes | -1500 | 1500 | 0.1 | 0 | -9999 | |
| | **LDASOUT_DOMAIN** | HFX | Total sensible heat to the atmosphere | average (+ to atmosphere) | Yes | No | No | Yes | No | Yes | Yes | -1500 | 1500 | 0.1 | 0 | -9999 | |
| | **LDASOUT_DOMAIN** | LH | Total latent heat to the atmosphere | (+ to atmosphere) | Yes | No | No | Yes | No | Yes | Yes | -1500 | 1500 | 0.1 | 0 | -9999 | |
| | **LDASOUT_DOMAIN** | ECAN | Canopy water evaporation rate | Canopy water evaporation rate | Yes | No | No | No | No | No | No | -100 | 100 | 0.00001 | 0 | -9999 | |
| | **LDASOUT_DOMAIN** | EDIR | Direct from soil evaporation rate | Direct soil evaporation rate | Yes | Yes | No | No | No | Yes | Yes | -100 | 100 | 0.00001 | 0 | -999 | |
| | **LDASOUT_DOMAIN** | ALBEDO | Surface albedo | Total-grid surface albedo | Yes | No | No | No | No | Yes | No | 0 | 1 | 0.01 | 0 | -9999 | |
| | **LDASOUT_DOMAIN** | ETRAN | Transpiration rate | Transpiration rate | Yes | No | No | No | No | No | No | -100 | 100 | 0.00001 | 0 | -9999 | |
| | **LDASOUT_DOMAIN** | UGDRNOFF | Accumulated underground runoff | accumulated | Yes | No | No | Yes | Yes | Yes | Yes | -100 | 100000 | 0.01 | 0 | -9999 | |
| | **LDASOUT_DOMAIN** | SFCRNOFF | Accumulated surface runoff | Surface runoff: accumulated | Sometimes | No | No | No | Sometimes | Sometimes | Sometimes | 0 | 100000 | 0.001 | 0 | -9999 | Only available when overland routing is inactive |
| | **LDASOUT_DOMAIN** | CANLIQ | Canopy liquid water content | Canopy liquid water content | Yes | No | No | No | No | No | No | -5 | 30000 | 0.01 | 0 | -9999 | |
| | **LDASOUT_DOMAIN** | CANICE | Canopy ice water content | Canopy ice water content | Yes | No | No | No | No | No | No | -5 | 30000 | 0.01 | 0 | -9999 | |
| | **LDASOUT_DOMAIN** | ZWT | Depth to the water table | Depth to water table | Yes | No | No | No | No | No | No | 0 | 10 | 0.00001 | 0 | -9999 | |
| | **LDASOUT_DOMAIN** | WA | Water in aquifer | reference level | Yes | No | No | No | No | No | No | 0 | 10000 | 0.01 | 0 | -9999 | |
| | **LDASOUT_DOMAIN** | WT | Water in aquifer and saturated soil | soil | Yes | No | No | No | No | No | No | 0 | 10000 | 0.01 | 0 | -9999 | |
| | **LDASOUT_DOMAIN** | ACCPRCP | Accumulated precip | Accumulated precipitation | Yes | No | No | No | No | No | No | 0 | 1000000 | 0.01 | 0 | -9999 | |
| | **LDASOUT_DOMAIN** | ACCECAN | Accumulated canopy water | evaporation | Yes | No | No | Yes | No | No | Yes | -100 | 1000000 | 0.01 | 0 | -9999 | |
| | **LDASOUT_DOMAIN** | ACCEDIR | Accumulated direct soil evap | evaporation | Yes | No | No | Yes | No | No | Yes | -100 | 1000000 | 0.01 | 0 | -9999 | |
| | **LDASOUT_DOMAIN** | ACCETRAN | Accumulated transpiration | Accumulated transpiration | Yes | No | No | Yes | No | No | Yes | -100 | 1000000 | 0.01 | 0 | -9999 | |
| | **LDASOUT_DOMAIN** | SAV | vegetation | vegetation canopy | Yes | No | No | No | No | No | No | -1500 | 1500 | 0.1 | 0 | -9999 | |
| | **LDASOUT_DOMAIN** | TR | Transpiration heat | Transpiration heat flux | Yes | No | No | No | No | No | No | -1500 | 1500 | 0.1 | 0 | -9999 | |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **LDASOUT_DOMAIN** | EVC | Canopy evap heat | air | Yes | No | No | No | No | No | No | -1500 | 1500 | 0.1 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | IRC | Canopy net LW rad | canopy | Yes | No | No | No | No | No | No | -1500 | 1500 | 0.1 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | SHC | Canopy sensible heat | canopy air | Yes | No | No | No | No | No | No | -1500 | 1500 | 0.1 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | IRG | Ground net LW rad | below-canopy ground | Yes | No | No | No | No | No | No | -1500 | 1500 | 0.1 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | SHG | Ground sensible heat | canopy ground to canopy air | Yes | No | No | No | No | No | No | -1500 | 1500 | 0.1 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | EVG | Ground evap heat | ground to canopy air | Yes | No | No | No | No | No | No | -1500 | 1500 | 0.1 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | GHV | Ground heat flux + to soil vegetated | fraction (+ to soil) | Yes | No | No | No | No | No | No | -1500 | 1500 | 0.1 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | SAG | ground | ground surface | Yes | No | No | No | No | No | No | -1500 | 1500 | 0.1 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | IRB | Net LW rad to atm bare | ground | Yes | No | No | No | No | No | No | -1500 | 1500 | 0.1 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | SHB | Sensible heat atm bare | to atmosphere | Yes | No | No | No | No | No | No | -1500 | 1500 | 0.1 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | EVB | Evaporation heat to atm bare | to atmosphere | Yes | No | No | No | No | No | No | -1500 | 1500 | 0.1 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | GHB | Ground heat flux + to soil bare | fraction (+ to soil) | Yes | No | No | No | No | No | No | -1500 | 1500 | 0.1 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | TRAD | Surface radiative temperature | grid | Yes | No | No | Yes | No | Yes | Yes | 0 | 400 | 0.1 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | TG | Ground temperature | average | Yes | No | No | No | No | No | No | 0 | 400 | 0.1 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | TV | Vegetation temperature | Vegetation leaf temperature | Yes | No | No | No | No | No | No | 0 | 400 | 0.1 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | TAH | Canopy air temperature | Canopy air temperature | Yes | No | No | No | No | No | No | 0 | 400 | 0.1 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | TGV | Ground surface Temp vegetated | vegetated ground | Yes | No | No | No | No | No | No | 0 | 400 | 0.1 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | TGB | Ground surface Temp bare | ground | Yes | No | No | No | No | No | No | 0 | 400 | 0.1 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | T2MV | 2m Air Temp vegetated | vegetated ground | Yes | No | No | No | No | No | No | 0 | 400 | 0.1 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | T2MB | 2m Air Temp bare | ground | Yes | No | No | No | No | No | No | 0 | 400 | 0.1 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | Q2MV | 2m mixing ratio vegetated | ground | Yes | No | No | No | No | No | No | 0 | 1 | 0.0001 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | Q2MB | 2m mixing ratio bare | ground | Yes | No | No | No | No | No | No | 0 | 1 | 0.0001 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | EAH | Canopy air vapor pressure | Canopy air vapor pressure | Yes | No | No | No | No | No | No | -1000 | 100000 | 0.1 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | FWET | Wetted or snowed fraction of canopy | liquid or frozen water | Yes | No | No | No | No | No | No | 0 | 1 | 0.01 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | ZSNSO_SN | Snow layer depths from snow surface | (from snow surface) | Yes | No | No | No | No | No | No | -100 | 100 | 0.00001 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | SNICE | Snow layer ice | Snow layer ice | Yes | No | No | No | No | No | No | 0 | 100000 | 0.01 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | SNLIQ | Snow layer liquid water | Snow layer liquid water | Yes | Yes | No | Yes | No | No | Yes | 0 | 100000 | 0.01 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | SOIL_T | soil temperature | Soil temperature | Yes | Yes | No | Yes | No | No | Yes | 0 | 400 | 0.1 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | SOIL_W | liquid volumetric soil moisture | Volumetric soil moisture: liquid | Yes | No | No | No | No | Yes | Yes | 0 | 1 | 0.01 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | SNOW_T | snow temperature | Snow temperature | Yes | No | No | No | No | No | No | 0 | 400 | 0.1 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | SOIL_M | volumetric soil moisture | Volumetric soil moisture | Yes | Yes | No | Yes | No | Yes | Yes | 0 | 1 | 0.01 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | SNOWH | Snow depth | Snow depth | Yes | Yes | Yes | Yes | No | Yes | Yes | 0 | 100 | 0.0001 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | SNEQV | Snow water equivalent | Snow water equivalent | Yes | Yes | Yes | Yes | Yes | Yes | Yes | 0 | 100000 | 0.1 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | QSNOW | Snowfall rate | Snowfall rate at ground surface | Yes | Yes | No | No | No | Yes | Yes | 0 | 100 | 0.00001 | 0 | -999 |
| | **LDASOUT_DOMAIN** | ISNOW | Number of snow layers | Number of active snow layers | Yes | Yes | No | Yes | No | No | Yes | 0 | 10 | 1 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | FSNO | Snow-cover fraction on the ground | snow | Yes | Yes | Yes | Yes | No | Yes | Yes | 0 | 1 | 0.001 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | ACSNOW | accumulated snow fall | Accumulated snow fall | Yes | No | No | No | No | No | No | 0 | 100000 | 0.01 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | ACSNOM | snow bottom | of snow bottom | Yes | Yes | No | Yes | Yes | Yes | Yes | 0 | 100000 | 0.01 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | CM | Momentum drag coefficient | average | Yes | No | No | No | No | No | No | -5 | 5 | 0.00001 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | CH | Sensible heat exchange coefficient | average | Yes | No | No | No | No | No | No | -5 | 5 | 0.00001 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | CHV | Exchange coefficient vegetated | vegetation-atmosphere | Yes | No | No | No | No | No | No | -5 | 5 | 0.00001 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | CHB | Exchange coefficient bare | ground | Yes | No | No | No | No | No | No | -5 | 5 | 0.00001 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | CHLEAF | Exchange coefficient leaf | surface | Yes | No | No | No | No | No | No | -5 | 5 | 0.00001 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | CHUC | Exchange coefficient bare | canopy | Yes | No | No | No | No | No | No | -5 | 5 | 0.00001 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | CHV2 | vegetated | vegetation-atmosphere @ 2- | Yes | No | No | No | No | No | No | -5 | 5 | 0.00001 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | CHB2 | Exchange coefficient 2-meter bare | ground @ 2-meters | Yes | No | No | No | No | No | No | -5 | 5 | 0.00001 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | LFMASS | Leaf mass | Leaf carbon mass | Yes | No | No | No | No | No | No | 0 | 1000 | 0.01 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | RTMASS | Mass of fine roots | Root carbon mass | Yes | No | No | No | No | No | No | 0 | 1000 | 0.01 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | STMASS | Stem mass | Stem carbon mass | Yes | No | No | No | No | No | No | 0 | 1000 | 0.01 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | WOOD | Mass of wood and woody roots | mass | Yes | No | No | No | No | No | No | 0 | 1000 | 0.01 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | STBLCP | Stable carbon in deep soil | Stable carbon in deep soil | Yes | No | No | No | No | No | No | 0 | 5000 | 0.01 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | FASTCP | Short-lived carbon in shallow soil | soil | Yes | No | No | No | No | No | No | 0 | 5000 | 0.01 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | NEE | Net ecosystem exchange | Net ecosystem exchange | Yes | No | No | No | No | No | No | 0 | 1000 | 0.01 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | GPP | Net instantaneous assimilation | assimilation | Yes | No | No | No | No | No | No | 0 | 1000 | 0.01 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | NPP | Net primary productivity | Net primary productivity | Yes | No | No | No | No | No | No | 0 | 1000 | 0.01 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | PSN | Total photosynthesis | Total photosynthesis | Yes | No | No | No | No | No | No | 0 | 1000 | 0.01 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | APAR | canopy | active radiation | Yes | No | No | No | No | No | No | 0 | 1000 | 0.01 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | ACCET | Accumulated total ET | evapotranspiration | Yes | Yes | Yes | Yes | Yes | Yes | Yes | -1000 | 1000000 | 0.01 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | CANWAT | Total canopy water (liquid + ice) | ice) | Yes | No | No | Yes | Yes | No | Yes | -5 | 30000 | 0.01 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | SOILICE | fraction of soil moisture that is ice | ice | Yes | Yes | No | Yes | No | No | Yes | 0 | 1 | 0.01 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | SOILSAT_TOP | fraction of soil saturation, top 2 layers | 2 layers | Yes | Yes | Yes | Yes | Yes | No | Yes | 0 | 1 | 0.001 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | SOILSAT | integrated | column integrated | Yes | No | No | No | Yes | No | Yes | 0 | 1 | 0.001 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | SNOWT_AVG | average snow temperature (by layer mass) | Average snow temperature (by layer mass) | Yes | Yes | Yes | Yes | No | No | Yes | 0 | 400 | 0.1 | 0 | -9999 |
| | **LDASOUT_DOMAIN** | ALBSND | snowpack albedo, direct | Snowpack albedo, direct | Yes | No | No | No | No | Yes | No | 0 | 1 | 0.01 | 0 | -9999 |

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| | **LDASOUT_DOMAIN** | ALBSNI | snowpack albedo, diffuse | Snowpack albedo, diffuse | Yes | No | No | No | No | Yes | No | 0 | 1 | 0.01 | 0 | -9999 | |
| | **LDASOUT_DOMAIN** | QRAIN | Rainfall rate on the ground | Rate of liquid precipitation reaching the ground | Yes | Yes | No | No | No | Yes | Yes | 0 | 100 | 0.00001 | 0 | -999 | |
| **Land surface diagnostic output** | **LSMOUT_DOMAIN** | time | valid output time | Valid output time | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | |
| | **LSMOUT_DOMAIN** | reference_time | model initialization time | Model initialization time | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | |
| | **LSMOUT_DOMAIN** | x | x coordinate of projection | projection) | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | |
| | **LSMOUT_DOMAIN** | y | y coordinate of projection | projection) | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | |
| | **LSMOUT_DOMAIN** | crs | CRS definition | Coordinate reference system | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | |
| | **LSMOUT_DOMAIN** | stc1 | Soil temperature in the top layer | layer | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | scale/offset/compression |
| | **LSMOUT_DOMAIN** | smc1 | Soil moisture in the top layer | top layer | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | scale/offset/compression |
| | **LSMOUT_DOMAIN** | sh2ox1 | layer | Liquid water in the top layer | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | scale/offset/compression |
| | **LSMOUT_DOMAIN** | stc2 | Soil temperature in the second layer | layer | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | scale/offset/compression |
| | **LSMOUT_DOMAIN** | smc2 | Soil moisture in the second layer | second layer | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | scale/offset/compression |
| | **LSMOUT_DOMAIN** | sh2ox2 | layer | layer | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | scale/offset/compression |
| | **LSMOUT_DOMAIN** | stc3 | Soil temperature in the third layer | layer | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | scale/offset/compression |
| | **LSMOUT_DOMAIN** | smc3 | Soil moisture in the third layer | third layer | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | scale/offset/compression |
| | **LSMOUT_DOMAIN** | sh2ox3 | layer | Liquid water in the third layer | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | scale/offset/compression |
| | **LSMOUT_DOMAIN** | stc4 | Soil temperature in the fourth layer | layer | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | scale/offset/compression |
| | **LSMOUT_DOMAIN** | smc4 | layer | bottom layer | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | scale/offset/compression |
| | **LSMOUT_DOMAIN** | sh2ox4 | layer | Liquid water in the bottom layer | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | scale/offset/compression |
| | **LSMOUT_DOMAIN** | infxsrt | Infiltration excess | Infiltration excess (from LSM) | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | scale/offset/compression |
| | **LSMOUT_DOMAIN** | sfcheadrt | Surface head | Surface head (from HYDRO) | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | scale/offset/compression |